

WHAT IS CLAIMED IS:

5348544 all

✓ 1. A needlepoint-covering member for covering the needlepoint of the injection needle comprising a needle having a sharp needlepoint and a needle hub provided at the end of the needle far from the needlepoint for being joined with the cylinder, comprising:

a plate member whose end is fixed to the needle hub side and which can be bent to less than half of the axial length in the extended state in order to maintain the state before covering; and

a covering portion for covering the needlepoint when the bent plate member is extended;

wherein the plate member has a length to allow the covering portion to reach the position of the needlepoint when extended; and is widthwise concaved toward the needle for resisting external forces that tend to remove the covering portion that covers the needlepoint from the needlepoint.

2. A needlepoint-covering member according to Claim 1, wherein the plate member is provided with a wrap-around fixing portion for embracing the circumference of the needle and fixing the needle in the vicinity of the center in the axial direction of the plate member, and the wrap-around fixing portion is formed in such a manner that the curvature radius of the plate member

09978169-404704

THE UNIVERSITY OF CHICAGO

~~fig. 5.~~

wherein the plate member is provided with an engaged

4.

a plate member whose end is fixed to the needle hub side

a covering portion for covering the needlepoint when the

wherein the covering portion has a tubular shape for

bent;

wherein the plate member has a length to allow the covering portion to reach the position of the needlepoint when extended; and

wherein the direction in which the plate member is bent by external forces that tend to remove the covering portion from the needlepoint is convex toward the needle.

5. A needlepoint-covering member according to Claim 4, wherein the plate member is formed of a plate member that is widthwise curved convexly toward the needle.

6. A needlepoint-covering member according to Claim 4, wherein geometrical moment of inertia of at least one of both ends of the plate member in the extended state is determined to the value lower than that of other portions.

7. A needlepoint-covering member according to Claim 4, further comprising a needlepoint hinge for rotatably connecting the covering portion and the plate member on the side far from the needle with respect to the plate member.

8. A needlepoint-covering member according to Claim 4, further comprising a proximal hinge for rotatably connecting the needle hub and the plate member on the side far from the

09978160-104704

[illegible]

9.

a bending-position-maintaining member for maintaining late member in the bent state before covering the point by the covering portion, and

a trigger-function portion for releasing a load from the
of being maintained in the bent state.

10.

a bending-position-maintaining member for maintaining late member in the bent state before covering the epoint by the covering portion, and

a trigger-function portion for releasing a load from the
of being maintained in the bent state.

611

to the needlepoint;

wherein the plate member is maintained in the bent state by engaging the proximal hook and the needlepoint hook, and the engaged state between the proximal hook and the needlepoint hook may be released by changing the angle of the proximal hinge.

05070609 "404704
12. A needlepoint-covering member according to Claim 4, wherein the plate member comprises a proximal hinge for fixing the end on the needle hub side of the plate member so as to be capable of rotating with respect to the axis of the needle; an upwardly opened proximal hook fixed on the plate member at the position closer to the needle hub; and a downwardly opened needlepoint hook fixed on the plate member at the position closer to the needlepoint;

wherein the plate member is maintained in the bent state by engaging the proximal hook and the needlepoint hook, and the engaged state between the proximal hook and the needlepoint hook may be released by changing the angle of the proximal hinge.

13. A needlepoint-covering member according to Claim 11, wherein the plate member comprises a needlepoint hinge for fixing the end portion on the needlepoint side of the plate member so as to be capable of rotating with respect to the axis of the needle.

14. A needlepoint-covering member according to Claim 12, wherein the plate member comprises a needlepoint hinge for fixing the end portion on the needlepoint side of the plate member so as to be capable of rotating with respect to the axis of the needle.

15. A needlepoint-covering member according to Claim 1, further comprising a cap for covering at least the needlepoint and the needle with the plate member maintained in the bent state.

16. A needlepoint-covering member according to Claim 4, further comprising a cap for covering at least the needlepoint and the needle with the plate member maintained in the bent state.

17. A method of assembling the injection needle with a needlepoint-covering member comprising:

a fixing step for fixing the needle and the needle hub for manufacturing a hub with a needle;

an incorporating step for centering and incorporating the needlepoint-covering member into a cap for covering the needle; and

a capping step for incorporating the hub with a needle into the cap that is provided with the needlepoint-covering member incorporated in the incorporating step.

18. An injection syringe with a needlepoint-covering member described in Claim 1, comprising:

a hub with a needle in which a needle and a needle hub are fixed with each other, and

an injection syringe provided with the hub with a needle fixed at its tip.

19. An injection syringe with a needlepoint-covering member described in Claim 4, comprising:

a hub with a needle in which a needle and a needle hub are fixed with each other, and

an injection syringe provided with the hub with a needle fixed at its tip.

00070169-101701